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SEED GERMINATION OF TWO MEDICINAL PLANTS: *DESMODIUM PULCHELLUM* (L.) BENTH. AND *D. TRIFLORUM* (L.) DC.

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Desmodium pulchellum (L.) Benth. and *D. triflorum* (L.) DC. are two important medicinal plants of the family Fabaceae. *D. pulchellum* is a shrub, characterized by its finely grey-downy branches, ovate to oblong leaflets, narrowly triangular stipules, orbicular persistent bracts which conceals the flowers and fruits, white corolla, and short incurved style covered with appressed hairs. Its roots are used for burning sensations in the abdomen, flowers are used for dental caries and stem bark is given for head-ache (Jain, 1991). *D. triflorum* is a small herb, distinct by its prostrate or diffuse stem, obcordate, obovate or obtriangular chartaceous leaflets, purplish corolla with obovate standard petal, pubescent ovary and falcate pubescent pod. Leaves of this species are used as galactagogue, for the treatment of diarrhoea, dysentery and convulsions (Ghosal *et al.*, 1972), and roots are effective in the treatment of asthma, bilious complaints and abscesses (Ghani, 2003).

Seed germination is important to know the germination pattern of a plant, more particularly the medicinal ones that might need to bring under cultivation for the primary healthcare system. The significance of the seedling in plant population ecology has long been recognized (Silvertown and Lovett-Doust, 1993). The germination response pattern of seeds is also regarded as a key characteristic in plant life history strategy (Angevine and Chabot, 1979; Mayer and Poljakoff-Mayber, 1989). The variation in seed dormancy and the subsequent patterns of seedling emergence are controlled by environmental conditions. Important factors controlling the variation in seed dormancy within species include the environment of the mother plant during the time of seed maturation and environmental conditions after the seeds have been released (Liebst and Schneller, 2008). Certain environmental conditions may be required to break dormancy, and other conditions are often required to permit germination after dormancy is broken (Bewley, 1997). Seeds of many species require days, weeks, or months at low temperatures to break dormancy (Vleeshouwers *et al.*, 1995), whereas others require warm temperatures for after-ripening to germinate when permissive conditions arrive (Baskin and Baskin, 1972).

Many attempts have been made to investigate seed germination and seedling emergence of different annual and perennial species including medicinal plants (Baskin *et al*., 1993; Hassan and Fardous, 2003; Chauhan and Johnson, 2008; Liebst and Schneller, 2008; Liza *et al*., 2010). However, no study has surveyed germination patterns in *Desmodium* species in Bangladesh. Like many other important medicinal plants *D. pulchellum* and *D. triflorum* also need to bring under cultivation, but no work has been done so far in this direction. The aim of the present study is to investigate seed germination rate and level of dormancy of seeds in *D. pulchellum* and *D. triflorum* which might help in bringing the plants under cultivation.

The mature seeds of *Desmodium pulchellum* and *D. triflorum* were collected from different areas of the country and preserved under laboratory condition. Liza *et al.* (2010) was followed for seed germination experiment. Earthen pots of 10 inch in diameter filled up with a mixture of soil and compost (2:1) were used for seed sowing. Before sowing seeds were treated with fungicides to

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prevent fungal infection and microbial contamination. Five mature seeds for each species were tested for germination. Seeds were sown in the earthen pot and watering was done regularly. Germination defined as shoot emergence from seeds was checked regularly. Per cent of germination was calculated by the amount of seeds germinated in relation to total initial seed number. The time of 2-leaved stage was determined and measurement of seedlings in this stage was calculated.

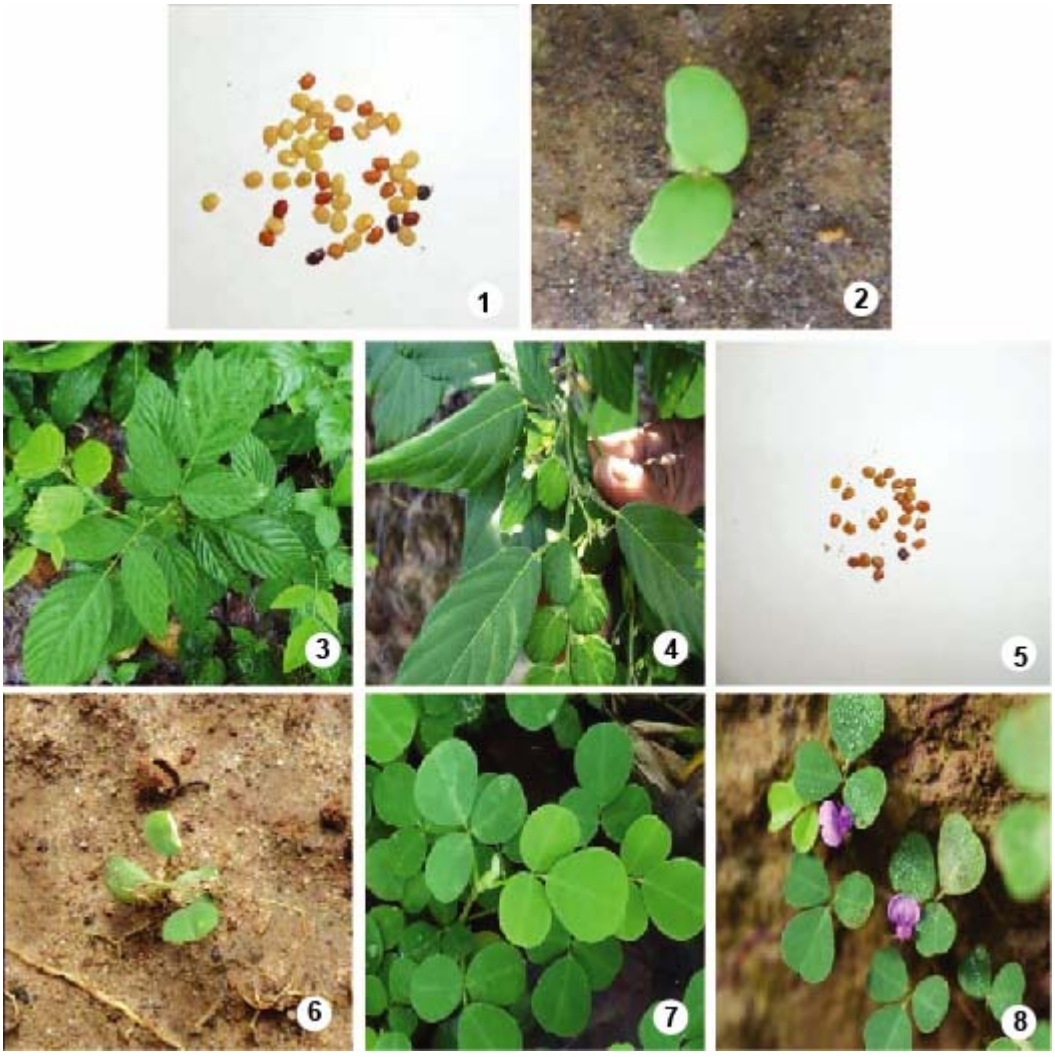

Plate 1. Development stages of two *Desmodium* species. 1-4. *D. pulchellum* (1. Seeds; 2. Seedling; 3. Mature plant; 4.Flowering stage). 5-8. *D. triflorum* (5. Seeds; 6. Seedling; 7. Mature plant; 8. Flowering stage).

The present study revealed the seed germination pattern in *Desmodium pulchellum* and *D. triflorum*. In *D. pulchellum* it took 5 days to germinate the seeds, and germination rate is 60%. It required 7 days to germinate the seeds in *D. triflorum* and the rate of seed germination was 20%

(Table 1). The development of seedlings from seeds up to maturity in the species studied has been shown in Plate 1.

Table 1. Seed germination period and rate in *D. pulchellum* and *D. triflorum*.

Species	Date of seed sowing	Date of germination	No. of seed sown	No. of seeds germinated	Days required for 2-leaved stage
D. pulchellum	14.07.11	18.07.11	5	3 (60%)	5 days
D. triflorum	14.07.11	20.07.11	5	1 (20%)	7 days

The first leaf appears 5 days after shoot germination in *D. pulchellum* and 7 days after in *D. triflorum* (Table 1). Seedling height in *D. triflorum* was 2 cm after 5 days of germination. In *D. pulchellum* the seedling height was 6 cm. Hypogeal type of germination was observed both in *D. pulchellum* and *D. triflorum*. The dormancy period of these species is very short, only for 5 days and 7 days in *D. pulchellum* and *D. triflorum*, respectively.

In this study, seeds of these two species were not collected at the same time because of the differences in the period of seed production among the species. Therefore, the level of dormancy observed may be affected by environmental factors. Jain (1982) provided a clear evidence of variation in seed dormancy among different population of a single species. Gerry and Wilson (1995) states that the number of days for germination is positively related to seed size, the largest seeds germinated faster than the smaller seeds. The results obtained from the present study support the hypothesis of Gerry and Wilson (1995). Since different environmental factors including light intensity and temperature affect on seed germination, therefore detailed study should be carried out considering these factors that might through more light on germination patterns.

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